

**REMARKS/ELECTION**

The Examiner has required an election from among the following groups of claims:

- Group I: (Claim 1) – directed to a process of producing an improved catalyst;
- Group II: (Claim 2) – directed to a process of producing an improved catalyst;
- Group III: (Claim 3) – directed to a process of producing an improved catalyst;
- Group IV: (Claim 4) – directed to a catalyst produced by the process of Claim 1;
- Group V: (Claim 5) – directed to a catalyst produced by the process of Claim 2;
- Group VI: (Claim 6) – directed to a catalyst produced by the process of Claim 3;
- Group VII: (Claim 7) – directed to a process for preparing unsaturated carboxylic acid compounds using the catalyst produced by the process of Claim 1;
- Group VIII: (Claim 8) – directed to a process for preparing unsaturated carboxylic acid compounds using the catalyst produced by the process of Claim 2;
- Group IX: (Claim 9) – directed to a process for preparing unsaturated carboxylic acid compounds using the catalyst produced by the process of Claim 3;
- Group X: (Claim 10) – directed to a process for preparing unsaturated nitrile compounds using the catalyst produced by the process of Claim 1;
- Group XI: (Claim 11) – directed to a process for preparing unsaturated nitrile compounds using the catalyst produced by the process of Claim 2; and
- Group XII: (Claim 12) – directed to a process for preparing unsaturated nitrile compounds using the catalyst produced by the process of Claim 3.

Initially, Applicants note that, by Preliminary Amendment filed concurrently with the present divisional patent application on August 7, 2003, Claims 1 and 4 have been cancelled since they were examined and allowed in the parent application (USSN 10/117,904, recently issued as US Pat. No. 6,645,905 on November 11, 2003). Copies of the aforesaid Preliminary Amendment and the date-stamped return postcard receipt (evidencing its receipt in the US Patent Office) accompany this Election. In the foregoing circumstances, it is believed that the restriction requirement set forth by the Examiner is moot as applied to Claims 1 and 4.

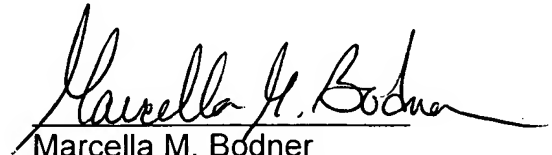
Applicants hereby elect, without traverse, to prosecute the claim of Group II (i.e., Claim 2), directed to a process for producing an improved catalyst. It is understood that Applicants retain the right to file one or more divisional U.S. patent applications directed to the claims of the non-elected groups (i.e., Group II) at any time during the pendency of the present application.

Moreover, Applicants hereby reserve the right to petition for rejoinder of the claims of one or more of the non-elected Groups, pursuant to MPEP § 806.05. Particularly, Applicants hereby reserve the right to petition for rejoinder of Group V, Claim 5, directed to the catalyst produced by the process of Claim 2, similar to the prosecution of the parent application. Furthermore, Applicants also particularly reserve the right to petition for rejoinder of Group VIII (Claim 8) and Group XI (Claim 11), which each relate to uses of the catalyst produced in elected Claim 2 to prepare unsaturated carboxylic acids and nitriles, respectively.

In view of the foregoing election and comments, Applicants respectfully request that the present application, including elected Claim 2, now be examined on the merits.

No fees are believed to be due in connection with the submission of this Election. If, however, any such fees are due, including extension and petition fees, the Examiner is hereby authorized to charge them to **Deposit Account No. 18-1850**.

Respectfully submitted,

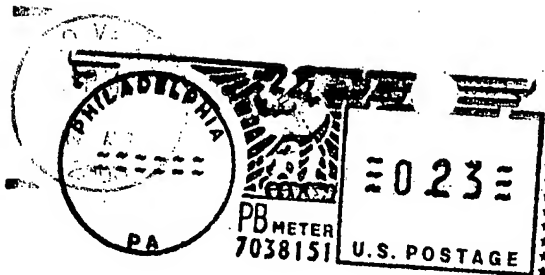
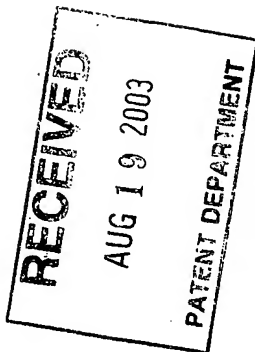
A handwritten signature in black ink, appearing to read "Marcella M. Bodner", written over a horizontal line.

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Date: **January 10, 2005**  
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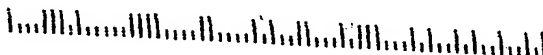


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CA 8-19-03

In connection with the below identified patent application, we  
hereby acknowledge receipt of:

Utility Patent Application Transmittal  
Fee Transmittal (in duplicate)  
Photocopy of Original Application  
Photocopy of Declaration and Power of Attorney  
Preliminary Amendment  
Certificate of Mailing

15535 U.S. PTO

10/636113



08/07/03

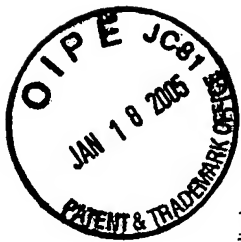
DN. A01229A Ser. No.            Filed Herewith

Certificate of Mailing: ☒ Yes ☐ No

Date Mailed 8/7/03 Initials mmB/yk

FORM 13663 6/94

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**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Docket Number: A01229A  
MMB/yv

In re application of:  
Anne Mae Gaffney, et al.

Serial No: 10/636,113 : Group Art Unit: 1626

Confirmation No.: 1580 :

Filed: 08/07/03 : Examiner: Kamal Saeed

For: **ANNEALED AND PROMOTED CATALYST**

**MAIL STOP: AMENDMENT**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**CERTIFICATE OF MAILING**

Sir:

I hereby certify that the following correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date indicated next to my signature below:

Remarks/Election

Copy of Preliminary Amendment and Copy of Return Receipt Postcard  
Return Receipt Postcard

Date 1/10/2005

Signature Yvette Vighanese

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of  
Anne Mae Gaffney, et al.

Group No. : to be determined

Application No.: to be assigned

Examiner : to be determined

Filed: herewith

For: ANNEALED AND PROMOTED  
CATALYST

\*This is a divisional of U.S. Serial No.  
10/117,904, filed April 8, 2002

COPY

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Mail Stop **PATENT APPLICATION**  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**PRELIMINARY AMENDMENT**

Sir:

Prior to examination on the merits, please amend the above-identified application as follows.

**AMENDMENTS TO THE SPECIFICATION** begin on page 2 of this paper.

**AMENDMENTS TO THE CLAIMS** are reflected in the listing of claims which begins on page 3 of this paper.

**REMARKS** begin on page 11 of this paper.

**AMENDMENTS TO THE SPECIFICATION**

Please add the following new heading and new paragraph immediately after the title on page 1 of the present specification, in accordance with 37 C.F.R. § 1.78:

**Cross Reference to Related Patent Applications**

This non-provisional application is a divisional of non-provisional U.S. Patent Application No. 10/117,904, filed April 8, 2002, now allowed, benefit of which is claimed under 35 U.S.C. § 120 and which in turn claims benefit under 35 U.S.C. § 119(e) of U.S. provisional Application No. 60/286,278, filed April 25, 2001, priority benefit of which is also claimed for the present divisional application.

## AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the present application:

Claim 1 (Cancelled).

2. (Original) A process for preparing an improved catalyst, said process comprising:

(a) providing a mixed metal oxide having the empirical formula



wherein A is at least one element selected from the group consisting of Mo and W, N is at least one element selected from the group consisting of Te, Sb and Se, and X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, Ce, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu,

wherein A, V, N and X are present in such amounts that the atomic ratio of A : V : N : X is a : b : c : d, and

wherein, when a = 1, b = 0.01 to 2, c = 0.01 to 1, d = 0.01 to 1 and e is dependent on the oxidation state of the other elements;

- (b) contacting said mixed metal oxide with a liquid contact member selected from the group consisting of organic acids, alcohols, inorganic acids and hydrogen peroxide to form a contact mixture;
- (c) recovering insoluble material from said contact mixture; and
- (d) calcining said recovered insoluble material in a non-oxidizing atmosphere in the presence of a source of halogen.



3. (Original) A process for preparing an improved catalyst, said process comprising:

(a) providing a mixed metal oxide having the empirical formula



wherein A is at least one element selected from the group consisting of Mo and W, N is at least one element selected from the group consisting of Te, Sb and Se, and X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, Ce, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu,

wherein A, V, N and X are present in such amounts that the atomic ratio of A : V : N : X is a : b : c : d, and

wherein, when a = 1, b = 0.01 to 2, c = 0.01 to 1, d = 0.01 to 1 and e is dependent on the oxidation state of the other elements;

- (b) contacting said mixed metal oxide with a liquid contact member selected from the group consisting of organic acids, alcohols, inorganic acids and hydrogen peroxide to form a contact mixture;
- (c) recovering insoluble material from said contact mixture;
- (d) calcining said recovered insoluble material in a non-oxidizing atmosphere to form a calcined recovered insoluble material; and
- (e) contacting said calcined recovered insoluble material with a source of halogen.

Claim 4 (Cancelled).

5. (Original) A catalyst produced by the process according to claim 2.

6. (Original) A catalyst produced by the process according to claim 3.

7. (Original) A process for producing an unsaturated carboxylic acid which comprises subjecting an alkane, or a mixture of an alkane and an alkene, to a vapor phase catalytic oxidation reaction in the presence of a catalyst produced by the process comprising:

(a) providing a mixed metal oxide having the empirical formula



wherein A is at least one element selected from the group consisting of Mo and W, N is at least one element selected from the group consisting of Te, Sb and Se, and X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, Ce, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Ag, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu,

wherein A, V, N and X are present in such amounts that the atomic ratio of A : V : N : X is a : b : c : d, and

wherein, when a = 1, b = 0.01 to 2, c = 0.01 to 1, d = 0.01 to 1 and e is dependent on the oxidation state of the other elements,

(b) contacting said mixed metal oxide with a liquid contact member selected from the group consisting of organic acids, alcohols, inorganic acids and hydrogen peroxide to form a contact mixture;

(c) recovering insoluble material from said contact mixture;

(d) calcining said recovered insoluble material in a non-oxidizing atmosphere;

(e) admixing said calcined recovered insoluble material with

(i) at least one promoter element or compound thereof, wherein said at least one promoter element is selected from the group consisting of Au, Ag, Re, Pr, Zn, Ga, Pd, Ir, Nd, Y, Sm, Tb, Br, Cu, Sc, Cl, F and I, and

(ii) at least one solvent for said promoter element or compound thereof to form an admixture;

(f) removing said at least one solvent from said so-formed admixture to form a catalyst precursor; and

(g) calcining said catalyst precursor.

8. (Original) A process for producing an unsaturated carboxylic acid which comprises subjecting an alkane, or a mixture of an alkane and an alkene, to a vapor phase catalytic oxidation reaction in the presence of a catalyst produced by the process comprising:

(a) providing a mixed metal oxide having the empirical formula



wherein A is at least one element selected from the group consisting of Mo and W, N is at least one element selected from the group consisting of Te, Sb and Se, and X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, Ce, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Ag, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu,

wherein A, V, N and X are present in such amounts that the atomic ratio of A : V : N : X is a : b : c : d, and

wherein, when a = 1, b = 0.01 to 2, c = 0.01 to 1, d = 0.01 to 1 and e is dependent on the oxidation state of the other elements,

(b) contacting said mixed metal oxide with a liquid contact member selected from the group consisting of organic acids, alcohols, inorganic acids and hydrogen peroxide to form a contact mixture;

(c) recovering insoluble material from said contact mixture; and

(d) calcining said recovered insoluble material in a non-oxidizing atmosphere in the presence of a source of halogen.

9. (Original) A process for producing an unsaturated carboxylic acid which comprises subjecting an alkane, or a mixture of an alkane and an alkene, to a vapor phase catalytic oxidation reaction in the presence of a catalyst produced by the process comprising:

(a) providing a mixed metal oxide having the empirical formula



wherein A is at least one element selected from the group consisting of Mo and W, N is at least one element selected from the group consisting of Te, Sb and Se, and X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, Ce, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Ag, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu,

wherein A, V, N and X are present in such amounts that the atomic ratio of A : V : N : X is a : b : c : d, and

wherein, when a = 1, b = 0.01 to 2, c = 0.01 to 1, d = 0.01 to 1 and e is dependent on the oxidation state of the other elements,

- (b) contacting said mixed metal oxide with a liquid contact member selected from the group consisting of organic acids, alcohols, inorganic acids and hydrogen peroxide to form a contact mixture;
- (c) recovering insoluble material from said contact mixture;
- (d) calcining said recovered insoluble material in a non-oxidizing atmosphere to form a calcined recovered insoluble material; and
- (e) contacting said calcined recovered insoluble material with a source of halogen.

10. (Original) A process for producing an unsaturated nitrile which comprises subjecting an alkane, or a mixture of an alkane and an alkene, and ammonia to a vapor phase catalytic oxidation reaction in the presence of a catalyst produced by the process comprising:

- (a) providing a mixed metal oxide having the empirical formula



wherein A is at least one element selected from the group consisting of Mo and W, N is at least one element selected from the group consisting of Te, Sb and Se, and X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe,

Ru, Co, Rh, Ni, Pt, Bi, B, In, Ce, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu,

wherein A, V, N and X are present in such amounts that the atomic ratio of A : V : N : X is a : b : c : d, and

wherein, when a = 1, b = 0.01 to 2, c = 0.01 to 1, d = 0.01 to 1 and e is dependent on the oxidation state of the other elements,

- (b) contacting said mixed metal oxide with a liquid contact member selected from the group consisting of organic acids, alcohols, inorganic acids and hydrogen peroxide to form a contact mixture;
- (c) recovering insoluble material from said contact mixture;
- (d) calcining said recovered insoluble material in a non-oxidizing atmosphere;
- (e) admixing said calcined recovered insoluble material with
  - (i) at least one promoter element or compound thereof, wherein said at least one promoter element is selected from the group consisting of Au, Ag, Re, Pr, Zn, Ga, Pd, Ir, Nd, Y, Sm, Tb, Br, Cu, Sc, Cl, F and I, and
  - (ii) at least one solvent for said promoter element or compound thereof to form an admixture;
- (f) removing said at least one solvent from said so-formed admixture to form a catalyst precursor; and
- (g) calcining said catalyst precursor.

11. (Original) A process for producing an unsaturated nitrile which comprises subjecting an alkane, or a mixture of an alkane and an alkene, and ammonia to a vapor phase catalytic oxidation reaction in the presence of a catalyst produced by the process comprising:

- (a) providing a mixed metal oxide having the empirical formula



wherein A is at least one element selected from the group consisting of Mo and W, N is at least one element selected from the

group consisting of Te, Sb and Se, and X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, Ce, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu,

wherein A, V, N and X are present in such amounts that the atomic ratio of A : V : N : X is a : b : c : d, and

wherein, when a = 1, b = 0.01 to 2, c = 0.01 to 1, d = 0.01 to 1 and e is dependent on the oxidation state of the other elements,

- (b) contacting said mixed metal oxide with a liquid contact member selected from the group consisting of organic acids, alcohols, inorganic acids and hydrogen peroxide to form a contact mixture;
- (c) recovering insoluble material from said contact mixture; and
- (d) calcining said recovered insoluble material in a non-oxidizing atmosphere in the presence of a source of halogen.

12. (Original) A process for producing an unsaturated nitrile which comprises subjecting an alkane, or a mixture of an alkane and an alkene, and ammonia to a vapor phase catalytic oxidation reaction in the presence of a catalyst produced by the process comprising:

- (a) providing a mixed metal oxide having the empirical formula



wherein A is at least one element selected from the group consisting of Mo and W, N is at least one element selected from the group consisting of Te, Sb and Se, and X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, Ce, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu,

wherein A, V, N and X are present in such amounts that the atomic ratio of A : V : N : X is a : b : c : d, and

wherein, when  $a = 1$ ,  $b = 0.01$  to  $2$ ,  $c = 0.01$  to  $1$ ,  $d = 0.01$  to  $1$  and  $e$  is dependent on the oxidation state of the other elements,

- (b) contacting said mixed metal oxide with a liquid contact member selected from the group consisting of organic acids, alcohols, inorganic acids and hydrogen peroxide to form a contact mixture;
- (c) recovering insoluble material from said contact mixture;
- (d) calcining said recovered insoluble material in a non-oxidizing atmosphere to form a calcined recovered insoluble material; and
- (e) contacting said calcined recovered insoluble material with a source of halogen.

**REMARKS**

Initially, is it noted that this Preliminary Amendment is in the newly approved revised format of amendments, such that a complete listing of claims is included and each section begins on a separate page of this paper.

Claims 1 and 4 have been cancelled by the foregoing amendments. Thus, Claims 2-3 and 5-12 remain pending in the present divisional patent application.

It is noted that Claims 1 and 4 have been cancelled because they are directed to an invention elected for prosecution in the parent application (i.e., U.S. Application No. 10/117, 904, filed April 8, 2002) which was recently allowed.

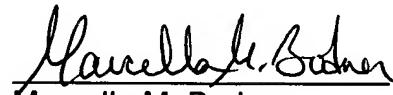
Lastly, by the foregoing amendments, the specification of the present divisional application has been amended to include the required cross-reference to related applications, whereby the present divisional application claims priority benefit from the non-provisional parent application under 35 U.S.C. § 120, as well as from the provisional application relied upon by the parent application under 35 U.S.C. § 119(e).

In view of the foregoing remarks and explanation, it is believed that no new matter has been introduced into the present application by the foregoing amendments.

Accordingly, early and favorable action on the present application is hereby requested.

Respectfully submitted,

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